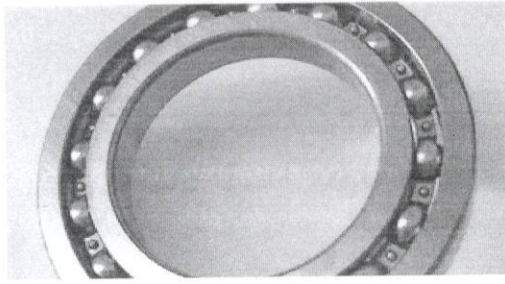


ball bearing



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ball bearing, one of the two members of the class of rolling, or so-called antifriction, bearings (the other member of the class is the roller bearing). The function of a ball bearing is to connect two machine members that move relative to one another in such a manner that the frictional resistance to motion is minimal. In many applications one of the members is a rotating shaft and the other a fixed housing.

There are three main parts in a ball bearing: two grooved, ringlike races, or tracks, and a number of hardened steel balls. The races are of the same width but different diameters; the smaller one, fitting inside the larger one and having a groove on its outside surface, is attached on its inside surface to one of the machine members. The larger race has a groove on its inside surface and is attached on its outside surface to the other machine member. The balls fill the space between the two races and roll with negligible friction in the grooves. The balls are loosely restrained and separated by means of a retainer or cage.

The most common ball bearing, with one row of balls, is usually classified as a radial ball bearing (*i.e.*, one designed to carry loads perpendicular to the axis of rotation), but its capacity for carrying an axial, or thrust, load (*i.e.*, a load parallel to the axis of rotation) may exceed its radial capacity. The angular-contact bearing has one side of the outer-race groove cut away to allow the insertion of more balls, which enables the bearing to carry large axial loads in one direction only. Such bearings are usually used in pairs so that high axial loads can be carried in both directions. The clearances in a single-row ball bearing are so small that no appreciable misalignment of a shaft relative to a housing can be accommodated. One type of self-aligning bearing has two rows of balls and a spherical inner surface on the outer race. For pure thrust loads there are ball thrust bearings that consist of two grooved plates with balls between. The outstanding advantage of a ball bearing over a sliding bearing is its low starting friction. At speeds high enough to develop a load-carrying oil film, however, the friction in a sliding bearing may be less than in a ball bearing.

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